TFW
AF/2638
Chung 2-19

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

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Signature: Lisa L. Vulpis Date: October 11, 2005

Applicant(s): S.-Y. Chung et al.
Case: 2-19
Serial No.: 09/765,754
Filing Date: January 19, 2001
Group: 2638
Examiner: Chieh M. Fan

Title: Multilevel Coding with Unequal Error Protection and Time Diversity for Bandwidth Efficient Transmission

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TRANSMITTAL OF REPLY BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is the following document relating to the above-identified patent application:

(1) Reply Brief.

It is believed that there is no additional fee due in conjunction with the response. In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Ryan, Mason & Lewis, LLP Deposit Account No. 50-0762** as required to correct the error.

Respectfully submitted,

Joseph B. Ryan

Date: October 11, 2005

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REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The remarks which follow are submitted in response to the Examiner's Answer dated August 10, 2005 in the above-identified application. The arguments presented by Applicants in their Appeal Brief dated May 20, 2005 are hereby incorporated by reference herein.

The Examiner in the Answer argues that the arrangement shown in FIG. 3 of U.S. Patent No. 5,323,424 (hereinafter "Fazel") is anticipatory of independent claim 1 and other independent claims of the present application. See the Answer, at pages 14-17. Applicants respectfully disagree with this characterization of Fazel.

Applicants initially note that independent claim 1 calls for separating a stream of information bits into a plurality of different portions. Claim 1 further recites that the stream of information bits to be separated comprises at least one frame of information bits that comprises a plurality of different classes of bits, with each class of bits comprising a plurality of contiguous bits of the frame. An example is the frame 500 shown in FIG. 5, and described at page 9, lines 24-27, of the specification. Thus, the stream of information bits to which the separating step of claim 1 is applied

already comprises different classes of bits, with each class comprising contiguous bits of the frame. The input data stream 34 applied to converter 30 in Fazel is not described as being configured in this manner. Fazel makes no mention whatsoever of frames, much less the configuration of the data stream 34 in a frame having separate classes each comprising multiple contiguous bits, as would be required by explicit recitations of claim 1. In fact, the word "frame" or variants thereof do not seem to appear in the Fazel reference.

Applicants therefore respectfully submit that the Fazel reference fails to disclose or suggest the application of a separating step to a frame format of the particular type recited in claim 1.

With regard to the particular characterization of converter 30 provided by the Examiner, Applicants note that the Examiner states that each of the outputs of the converter 30 must represent contiguous bits of an input frame in view of the example provided at column 7, lines 33-47. However, this example does not require that each of the outputs of the converter 30 comprises multiple contiguous bits of any input frame. The information bits k_1, k_2 and k_3 are simply blocks of bits which appear at respective first, second and third outputs of converter 30 in the example. There is no requirement in Fazel that each of these particular blocks of bits necessarily comprises contiguous bits of a frame of the input data stream 34.

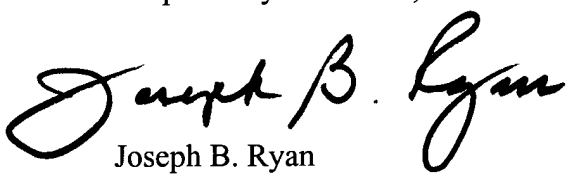
In support of his argument, the Examiner at page 17, first paragraph, of the Answer places emphasis on the phrase "last bits" as recited at column 7, line 45. However, Applicants believe the phrase is being taken out of context. The phrase simply refers to the fact that the k_3 block of bits is associated with the last of the three outputs of converter 30 in the example. It does not imply that the bits in the k_3 block of bits are necessarily contiguous with one another in the data stream 34. As Applicants described in their Appeal Brief, the converter 30 can operate in a manner which does not require that the k_i blocks of bits necessarily comprise contiguous bits of the data stream 34. The Examiner fails to appreciate that the encoders 31 of FIG. 3 typically include memory so as to be able to output a particular code word for a given k_i block of bits. Thus, if encoder 31_1 of FIG. 3 is a block encoder as described at column 6, lines 62-63, it generates a code word from a k_1 block of bits. This block of bits may be any combination of k_1 bits delivered by the converter 30 on the corresponding converter output, and the k_1 bits need not be contiguous bits from the data stream 34. The encoder

31_1 will simply store the non-contiguous bits as they are received from converter 30, and once the entire block of k_1 bits is available, will generate the corresponding code word.

It is also important to recognize that the error protection arrangement in Fazel does not require any particular relation between the bits presented at the various outputs of converter 30 and the positioning of those bits in the input data stream 34. Fazel simply provides the highest levels of protection for whatever bits are used to select symbols at the highest partitioning levels of the symbol constellation in modulator 32. That is, the bits of block k_1 are better protected than the bits of block k_2, and so on. See Fazel at column 6, lines 16-28, and column 7, lines 21-22. These bits are apparently assigned without regard to their positioning in the input data stream 34. As noted above, the input data stream 34 does not comprise a frame that is made up of classes of contiguous bits as would be required by claim 1.

For the reasons identified above and in their Appeal Brief, Applicants respectfully submit that claim 1 and the other independent claims are allowable over Fazel and the other prior art of record.

Respectfully submitted,



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